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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/001,897	11/21/2001	Rodney D. Taylor	3252.2.1	6913
28049	7590	04/22/2004		
PATE PIERCE & BAIRD 215 SOUTH STATE STREET, SUITE 550 PARKSIDE TOWER SALT LAKE CITY, UT 84111			EXAMINER WACHTEL, ALEXIS A	
			ART UNIT	PAPER NUMBER
			1764	

DATE MAILED: 04/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/001,897

Applicant(s)

TAYLOR, RODNEY D.

Examiner

Alexis Wachtel

Art Unit

1764

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 05 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-15 and 31-42 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 and 31-42 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 1-28-02.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

***Detailed Action***

***Claim Objection***

1. Claims 7-9,11,38,39 and 41 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Claim 7 is not seen to further limit claim 6. In particular, the method limitation recited in claim 7 does not structurally limit the apparatus as claimed in claim 6.

Claim 8 is not seen to further limit claim 6. In particular, the method limitation recited in claim 8 does not structurally limit the apparatus as claimed in claim 7.

Claim 9 is not seen to further limit claim 6. In particular, the method limitation recited in claim 9 does not structurally limit the apparatus as claimed in claim 8.

Claim 11 is not seen to further limit claim 10. In particular, the method limitation recited in claim 11 does not structurally limit the apparatus as claimed in claim 10.

Claim 12 is not seen to further limit claim 1. In particular, the claim language in claim 12: "repeat cycle timer" is alternatively and equivalently communicated by the claim language of claim 1: "synchronizer for controlling the metering pumps".

Claim 38 is not seen to further limit claim 37. In particular, the method limitation recited in claim 38 does not structurally limit the apparatus as claimed in claim 37.

Claim 39 is not seen to further limit claim 38. In particular, the method limitation recited in claim 39 does not structurally limit the apparatus as claimed in claim 38.

Claim 41 is not seen to further limit claim 40. In particular, the method limitation recited in claim 41 does not structurally limit the apparatus as claimed in claim 41.

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-15,31-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 4,247,531 to Hicks in view of US 4,143,115 to Ward et al.

Claims 7-9,11,38,39 and 41 constitute method limitations that fail to further limit the structure of parent apparatus claim 1. Accordingly, claims 7-9,11,38,39 and 41 are not seen to distinguish over the prior art applied below.

Hicks discloses a chlorine dioxide generation apparatus. Regarding claim 1 and 12, the apparatus comprises: a reaction column having multiple inlet ports (Fig.1, item 100); (Fig.2, item 200); (Fig.3, item 301); and (Fig.4, item 302).

Hicks teaches reactant sources (18); (39); and (27) but fails to teach how the reactants are delivered for conversion to a final product. In particular, Hicks fails to teach that the apparatus includes a plurality of metering pumps, and a synchronizer or a repeat cycle timer for controlling the metering pumps. Examiner notes that a repeat cycle timer and synchronizer are seen as identical. Ward et al teaches an apparatus for chlorine dioxide generation. The apparatus includes metering means for delivering reactant from its source to a reaction vessel. The metering means can be of a

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conventional structure or of a design for motivating the reactant, in predetermined amounts of flow, from its source to a reaction vessel (Col 3, lines 36-45). The examiner interprets "predetermined amounts" as a pulsed delivery of reactant. Additionally, Ward et al implies that control means are required to allow for pulsed delivery of reactant. Since Ward et al has established the conventionality of employing pulsed metering means for delivering reactant, it would have been obvious to one of ordinary skill to have employed a pulsed reactant metering system for the purpose of delivering reactants to a reaction zone. Additionally, it would have been obvious to have employed a synchronizer or repeat cycle timer type controller system as implied by Ward et al for controlling the operation of a pulsed reactant metering system since control means would be required and desired for the purpose of facilitating automatic operation of the metering means. Having configured such a control system to deliver precise and stoichiometrically equivalent simultaneous quantum of each of the reactants to a reaction zone or reaction area would have been considered only routine in the art since the operation of a chlorine dioxide generating apparatus would have been rendered more efficient by eliminating reaction completion time lags associated with staggered delivery of reactants.

Per claim 2: The apparatus of claim 1, the reaction column further configured to have a plurality of tee shaped internal passages (Hicks, Fig.2).

Per claim 3: The apparatus of claim 2, wherein the tee shaped passages are configured to introduce a plurality of reactant chemicals capable of forming chlorine dioxide to each other (Hicks, Fig.2, items 18, 39,27).

Per claim 4: The apparatus of claim 3, the tee shaped passages further configured to promote mixing of the reactant chemicals (Hicks, Fig.2). Examiner notes that the tee shaped passages are capable of promoting mixing of reactant chemicals.

Per claim 5: The apparatus of claim 4, wherein the tee shaped passages promote mixing of the reactant chemicals by providing at least one head on collision of the reactant chemicals (Hicks, Fig.2). Examiner notes that the tee shaped passages are capable of promoting mixing of reactant chemicals by way of fluid collision.

Per claim 6: The apparatus of claim 5, wherein the tee shaped passages further promote mixing of the reactant chemicals by generating turbulent flow in reactant chemicals by providing abrupt changes in the flow path (Hicks, Fig.2). Examiner notes that the bends in the tee shaped passages inherently generate turbulent flow since abrupt changes in the flow path are present.

Per claim 10: the apparatus of claim 9, wherein the first and second reactions occur under vacuum created by a carrier fluid flowing through an eductor (Hicks, Col 3, lines 18-20).

Per claim 13: An apparatus for chlorine dioxide generation, the apparatus comprising: a reaction column configured to have multiple inlet ports and a plurality of tee shaped internal passages; the tee shaped passages configured to introduce a plurality of reactant chemicals to each other; and the tee shaped passages further configured to promote turbulent mixing of the reactant chemicals (Hicks, 100; 200; 301; 302).

Per claim 14: The apparatus of claim 13, wherein the tee shaped passages promote mixing of the reactant chemicals by providing at least one head on collision of the reactant chemicals (Hicks, Fig.2). Examiner notes that the tee-shaped passages are capable of inducing collision between reactants.

Per claim 15: The apparatus of claim 14, wherein the tee shaped passages further promote mixing of the reactant chemicals by generating turbulent flow in reactant chemicals by providing abrupt changes in the flow path. Examiner notes that tee-shaped passages provide abrupt changes in the flow path and thus generate turbulent flow therein.

Per claims 31 and 42, Hicks discloses a chlorine dioxide generation apparatus. The apparatus includes means for delivering multiple reactants (18; 39; 27) to a reaction column (100; 200; 301; 302) the reaction column comprising multiple inlet ports to receive the multiple reactants and a first reaction site where selected reactants are introduced to one another.

However, Hicks fails to teach that the apparatus includes a plurality of metering pumps, and a synchronizer or a repeat cycle timer for controlling the metering pumps. Examiner notes that a repeat cycle timer and synchronizer are seen as identical. Ward et al teaches an apparatus for chlorine dioxide generation. The apparatus includes metering means for delivering reactant from its source to a reaction vessel. The metering means can be of a conventional structure or of a design for motivating the reactant, in predetermined amounts of flow, from its source to a reaction vessel (Col 3, lines 36-45). The examiner interprets "predetermined amounts" as a pulsed delivery of

reactant. Additionally, Ward et al implies that control means are required to allow for pulsed delivery of reactant. Since Ward et al has established the conventionality of employing pulsed metering means for delivering reactant, it would have been obvious to one of ordinary skill to have employed a pulsed reactant metering system for the purpose of delivering reactants to a reaction zone. Additionally, it would have been obvious to have employed a synchronizer or repeat cycle timer type controller system as implied by Ward et al for controlling the operation of a pulsed reactant metering system since control means would be required and desired for the purpose of facilitating automatic operation of the metering means. Having configured such a control system to deliver precise and stoichiometrically equivalent simultaneous quantum of each of the reactants to a reaction zone or reaction area would have been considered only routine in the art since the operation of a chlorine dioxide generating apparatus would have been rendered more efficient by eliminating reaction completion time lags associated with staggered delivery of reactants.

Per claim 32: The apparatus of claim 31, the reaction column further comprising: a first conduit conducting a first reactant of the multiple reactants from a first inlet port of the multiple inlet ports to the first reaction site; and a second conduit conducting a second reactant of the multiple reactants from a second inlet port of the multiple inlet ports to the first reaction site (Hicks, Fig.2).

Per claim 33: The apparatus of claim 3, the reaction column further comprising: a second reaction site; a third conduit conducting a third reactant of the multiple reactants from a third inlet port of the multiple inlet ports to the second reaction site; and a fourth



conduit conducting a mixture of the first and second reactants from the first reaction site to the second reaction site (Hicks, Fig.2).

Per claim 34: The apparatus as defined in claim 33, wherein the first, second and third conduits are further configured to promote mixing of the multiple reactants (Hicks, Fig.2).

Per claim 35: The apparatus as defined in claim 34, wherein the first and second conduits promote mixing by providing a substantially head on collision of the first and second reactants at the first reaction site (Hicks, Fig.2).

Per claim 36: The apparatus as defined in claim 35, wherein the first and second conduits promote mixing by generating turbulent flow in the first and second reactants through the use of abrupt, substantially right angle changes in the direction of flow (Hicks, Fig.2).

Per claim 37: The apparatus as defined in claim 36, wherein the selected reactants of the multiple reactant react in a first reaction at the first reaction site and a second reaction at the second reaction site (Hicks, Fig.2).

Per claim 40: The apparatus as defined in claim 39, wherein the first and second reactions occur under a vacuum created by a carrier fluid flowing through an eductor (Hicks, Col 3, lines 18-20).

#### ***Prior Art of Record***


4. The prior art of record and not relied upon is considered pertinent to Applicant's disclosure. In addition, the following references are cited for disclosing various aspects of Applicant's invention:

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US 5204081; US 4451444; US 3931737; US 4590057; US 5855861

**Conclusion**

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alex Wachtel whose telephone number is 571-272-1455. The examiner can normally be reached on 10:30am to 6:30pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Glenn Caldarola, can be reached at (571)-272-1444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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